Land Air & Water

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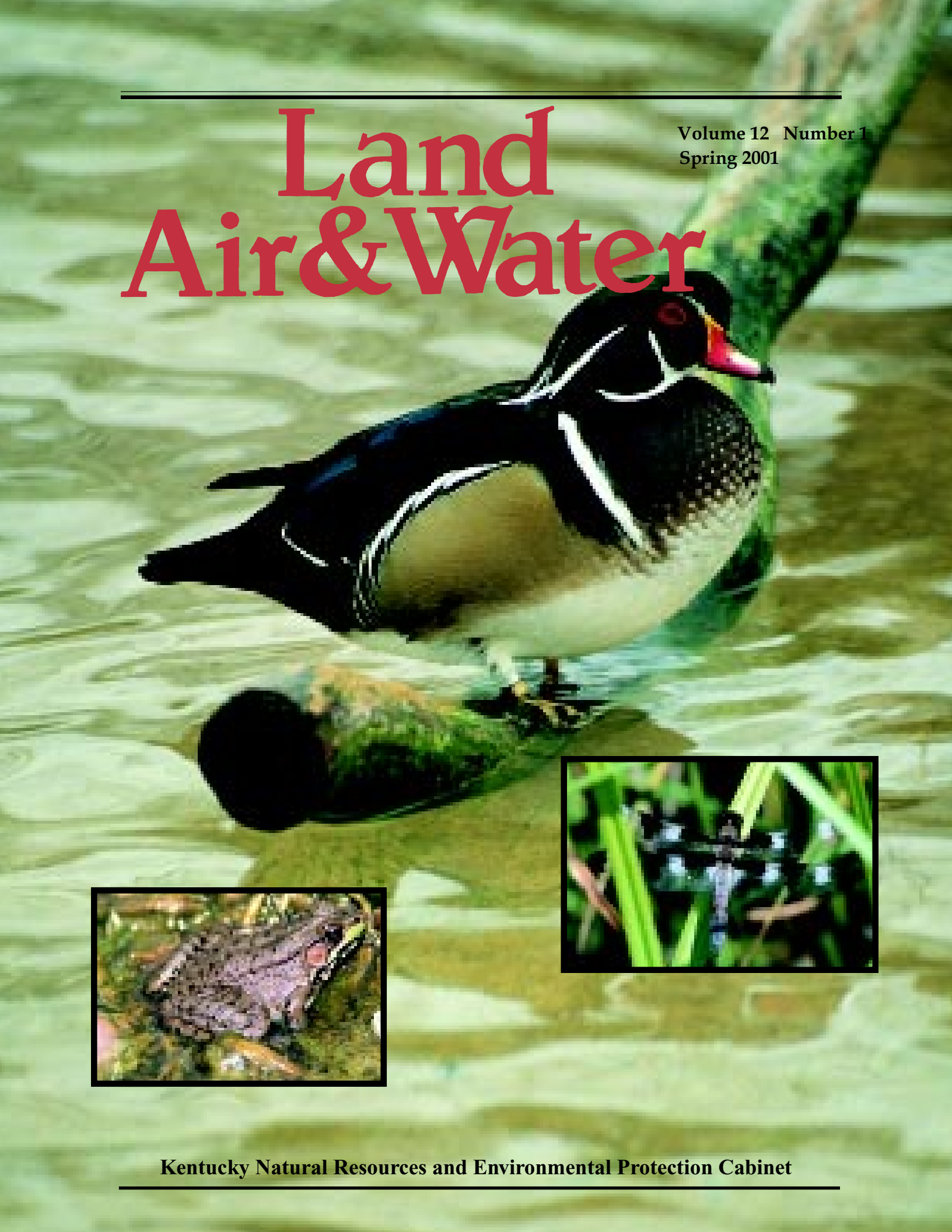
Spring 2001



Kentucky Natural Resources and Environmental Protection Cabinet

Land
Air&Water

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Editors
Heather Frederick
Cindy Schafer

Editorial Assistant
Julie Brumback Smither

Design & Production
Cindy Schafer

Agency Coordinators
Martin Bess, Maleva Chamberlain, Leslie Cole, Lillie Cox, Don Dott, Matt Hackathorn, Stan Henize, Gwen Holt, Karen Landry, Lee Ruggles, R.C. Story

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Thank you!

In the last issue of *Land, Air & Water* I asked a very big favor of you. I asked you to send in the back page of the winter issue if you wanted to continue receiving *Land, Air & Water*, and the responses have been pouring in! In the first two weeks alone, I received more than 500 envelopes containing your magazine's back page and new mailing addresses.

But that's not all—many of you also wrote some very kind words about the magazine and how much you enjoy reading it! It is great to know that so many of you depend on *Land, Air & Water* for the information it provides on environmental issues. It is also encouraging for me to know that you like the new magazine format, the quantity and quality of photographs, and the types of articles we are using to fill its pages.

The purpose of *Land, Air & Water* is to always keep you abreast of environmental legislation and regulations, cabinet programs and initiatives, new-and-improved cabinet Web sites, innovative technology as it relates to environmental progress, and updates about your area's water and air quality. In today's ever-changing world, you can never have enough information about your environment and ways that you can help protect it.

Please note that the back page of this issue is exactly the same as the last issue. No, it is not a mistake! I am running the same request again just in case you forgot to notify me or missplaced your copy.

If you did not respond previously, please rip off that back page and send it in. If you've already taken care of that business, then just enjoy the rest of the magazine.

The Natural Resources and Environmental Protection Cabinet hopes that you will continue to find *Land, Air & Water* full of the information and environmental coverage that you expect. As always, your comments are welcome.

Land
Air&Water **Online**

Visit *Land, Air & Water* magazine on the World Wide Web at
www.kyenvironment.org/nrepc/landairwater.htm

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what's inside

Land Air&Water

Spring 2001
Volume 12 Number 1

Features

Southern pine beetles

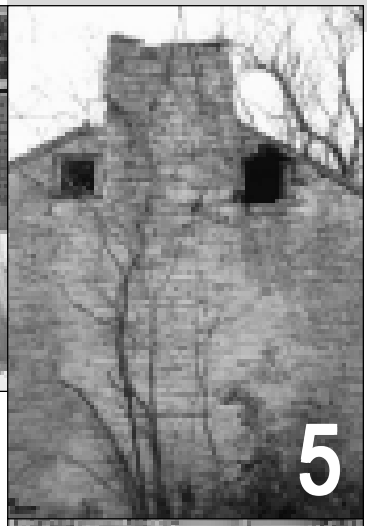
Their latest attack has wreaked havoc on Kentucky's pines. How much longer will we have to endure their destructive forces?

1-2

4

Down-hole technology 4

How a camera is used to determine domestic water well problems.



5

Commission dedicates 40th preserve 5

There are many treasures to behold on this protected property.

17

Recycling — a good thing 17

These Montessori students are teaching their peers and Versailles residents about recycling.

Printed by Gateway Press
Louisville, Kentucky

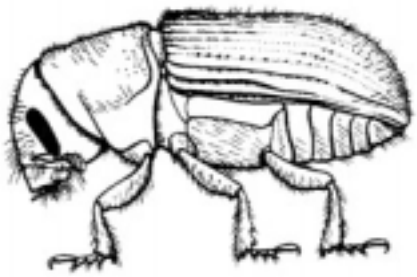
Contents

On the Cover

MAIN PHOTO: This male Wood duck (*Aix sponsa*) species can be found throughout the state nesting and breeding along ponds and streams. They are commonly seen in this area during the months of March-October. Photographed by Gary Ritter, Frankfort.

INSETS: The Green frog (*Rana clamitans*) is fairly common across most of Kentucky during spring and summer, also by Gary Ritter. The dragonfly is a male Twelve-spotted skimmer (*Libellula pulchella*). It was observed in Franklin County and is one of the most colorful species found during spring and summer. Photographed by Ellis Laudermilk, Kentucky State Nature Preserves Commission.

Southern pine beetles feast on Kentucky's pines



Adult southern pine beetle

By Diana Olszowy and Sara Sanders
Division of Forestry

In Kentucky's forests, an invader that's smaller than a grain of rice wreaks havoc. The tiny, unwelcome creature chisels its way into pine trees, threatening to wipe out large sections of timber and an important habitat for an endangered bird.

The southern pine beetle is the most destructive bark beetle found in the southeastern United States. It bores directly through a pine tree's outer bark into the living cambium, the thin layer that promotes new cell and secondary growth. When the beetle bores into the tree, the tree reacts by pushing pitch (pine resin) through the bore hole, forming what's known as a pitch tube. In this process, the beetle can become stuck in the resin and be pushed back out of the bore hole. This is the tree's only defense against the beetle. Pitch tubes are white and resemble kernels of popped corn. They are the most visible evidence that the beetles are at work.

The egg galleries that the beetle leaves beneath the tree bark eventually cut off the tree's flow of water and essential nutrients. This girdling action kills the tree.

Southern pine beetles occur naturally in forests, but are usually low in numbers. However, when adverse environmental conditions such as drought or storms create stress in trees, beetle populations can explode. Right now, an intense beetle attack that began in 1999 continues to take its toll on Kentucky's forests. So far, the beetles have infested about 62,000 acres of forest.

Beetles have infested about 62,000 acres of forest.

The last severe beetle outbreak in Kentucky occurred in 1975 and persisted until 1978. The extremely cold winter of 1978 put an end to the attack. These attacks usually last two to three years.

The beetle attacks and kills all species of yellow pine. In Kentucky, the preferred host trees are shortleaf, loblolly and Virginia pines. In cases of intense outbreaks, the beetle is also known to attack eastern white pine.

Trees that have been attacked by the southern pine beetle can be easily identified. Infested trees demonstrate faded foliage with red or yellow needles. Other symptoms of beetle attack can be found by examining the bark closely for the kernel-like pitch tubes or the twisting tunnels found beneath the bark.

Getting rid of the beetles during intense outbreaks is no easy task. Three methods are highly effective in controlling the beetle:

Salvage cutting which involves cutting down infested trees and selling the timber for pulp or sawtimber, and leaving a buffer of uninfested trees around the site.

ABOVE: ***Pitch tubes, resembling white kernels of popped corn, are visible on the tree bark.***

RIGHT: ***Southern pine beetle infestations are characterized by trees with reddish-brown crowns surrounded by those with green needles.*** Division of Forestry photos

LEFT: ***Southern pine beetles also bore exit holes in the bark.*** Photo courtesy of the University of Kentucky, College of Agriculture, Department of Entomology

BELOW: ***The Southern pine beetle is 1/8 inch long and has a cylindrical, reddish-brown to black body. All stages of the life cycle (egg, larva, pupa and adult) can be found in trees at any time.*** Division of Forestry photo

PHOTO AT LEFT AND DRAWING: ***Female beetles land 6 to 30 feet above the ground on mature trees and bore into the bark. There, they create S-shaped galleries under the bark where they mate and lay their eggs. The legless grubs feed in the inner bark, enlarging their tunnels as they grow. Mature larvae move to the outer bark and create a cell or cocoon where they continue to develop. New adults chew through the bark, leaving small, clearly visible, open exit holes. Generally, they leave the host tree and move to a nearby tree; however, some may fly several miles before attacking a new tree. When adults successfully attack a new host tree, they produce a chemical scent that attracts other males and females.***

** Some of the information and photographs included in this article was taken from the University of Kentucky Web site at **www.uky.edu/agriculture/entomology/entfacts/trees/ef443.htm**

Cut-and-Leave method involves cutting down infested trees and leaving them, but allowing a buffer strip of uninfested trees to remain at the site. When a tree is cut down, the pheromone trail, a chemical attractant that the beetles follow from tree to tree, is interrupted.

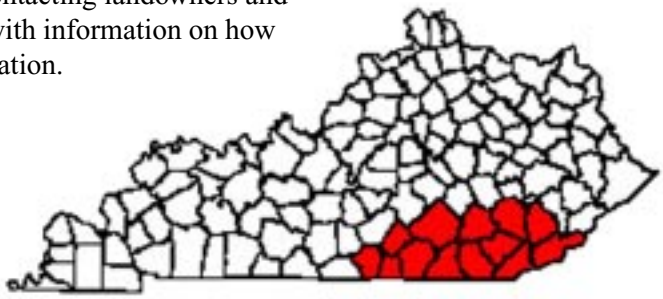
Chemical control methods can be effective on yard trees or small groups of trees in the landscape. A new product called Cyren 4E may be useful.

This most recent outbreak is much more severe in geographical extent and pine mortality, impacting many more counties than the 1975 outbreak. This most recent outbreak will result in a significant reduction in the acres of pine trees throughout Kentucky.

If you would like more information about the southern pine beetle and its damaging effects, please contact the Kentucky Division of Forestry, 627 Comanche Trail, Frankfort, KY 40601 or call (502) 564-4496.

The beetle attack takes its toll on Kentucky's forests

Counties with southern pine beetle outbreaks include: **Bell, Clay, Clinton, Cumberland, Harlan, Knox, Laurel, Leslie, McCreary, Pulaski, Russell, Wayne and Whitley**. Hundreds of infestation sites were spotted through aerial detection. The Division of Forestry is currently in the process of contacting landowners and providing them with information on how to slow the infestation.



Education grant helps clean up sinkhole dump

Stories by Rosetta Fackler
Division of Water

In Kentucky's cave country, illegal dumping in sinkholes is a serious problem. Sinkholes are direct conduits to underground water supplies. Using them as dumps can pollute downstream wells, springs and creeks, creating health hazards.

American Cave Conservation Association (ACCA) Director Dave Foster knows all about the hazards of polluted underground water. The ACCA spent many years addressing the pollution in Hart County's Hidden River Cave before being able to open the cave for educational programs and tourists.

The ACCA has continued to work to improve water quality education by helping to clean up illegal dumps. The association has used Clean Water Act Section 319(h) grant monies for educational programs about nonpoint source pollution, or runoff, using sinkhole cleanups as demonstration projects.

Recently, Foster, his staff and a group of volunteers removed several dump truck loads of old appliances, tires, concrete blocks and other assorted junk from a sinkhole on a Barren County farm. About 45 people worked by hand to haul the items out of the sinkhole.

Foster uses these cleanups to demonstrate and educate people about the quality of water flowing into underground water systems such as those that flow through Hidden River Cave and Mammoth Cave. "This gives us a chance to get lots of people involved in groundwater protection and communicate our message to people who might not otherwise know that there is anything wrong with dumping trash in a sinkhole," Foster said. "We believe that people respond well to our programs because we tie the boring groundwater concepts to something very interesting — cave environments. When we started doing cave conservation work in the 1980s, we realized early on that we couldn't protect caves without protecting water."

Volunteers clean up a sinkhole on Iron Mountain Road off KY 255 near Park City, Ky., last November. Photo by Gary Berdeaux, Diamond Caverns

The ACCA has another cleanup event planned for May 5, 2001. To get involved, call Foster at (270) 786-1466 or e-mail him at **acca@caveland.net.** To learn more about the American Cave Conservation Association, visit its Web site at **www.cavern.org** or write to ACCA, P.O. Box 409, Horse Cave, KY 42749.

For more information on applying for a 319(h) grant, contact the Nonpoint Source Section, Division of Water, 14 Reilly Road, Frankfort, KY 40601 or e-mail **nrepc.depdownps@mail.state. ky.us.**

Kentucky announces grant recipients for 2000

A number of Kentucky groups have received grant money aimed at controlling nonpoint source pollution problems in the Commonwealth.

Nonpoint source pollution, or runoff, enters Kentucky's waterways from a variety of sources. Runoff can occur when rain picks up pollutants from roadways and parking lots, lawn fertilizers and pesticides, and agricultural operations. Sedimentation from construction sites, logging operations, failing septic systems and straight pipes can also result in nonpoint source pollution.

Clean Water Act Section 319(h) grants provide funding to control identified nonpoint source pollution problems in priority watersheds and to implement statewide training and educational programs. Recipients of an award must provide nonfederal matching funds of 40 percent of the project value. Local community groups, environmental groups, private companies and public agencies are eligible for the grants.

The Nonpoint Source Pollution Control Program has announced the recipients of the competitive grants for the year 2000. They received grants totaling $825,000. The recipents are:

- **Rockcastle County Conservation District**, for Eastern Rockcastle County Septic System Watershed Project.

Funds to become available in 2002

The Division of Water's Nonpoint Source Pollution Control Program will receive $2.3 million in funds under Section 319(h) of the Clean Water Act. These funds will be used to address nonpoint source pollution in Kentucky and will be available in 2002.

Continued on Page 19

Camera goes underground to detect well damage

By Lee Florea
Department for Surface Mining Reclamation and Enforcement

In the winter 2001 issue of Land, Air & Water*, the Department for Surface Mining Reclamation and Enforcement (DSMRE) explained the use of down-hole camera technology to examine the impact of mining on groundwater supplies. DSMRE employees are also using this technology to detect evidence of subsidence in wells that has resulted from the collapse of underground mines.*

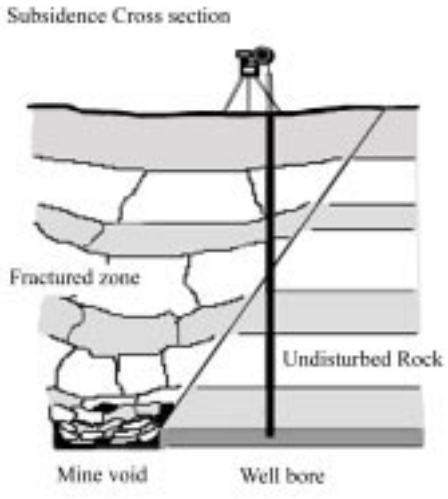
When a landowner submits a water well complaint to DSMRE, the agency's hydrogeologists investigate to determine whether mining is to blame. The investigation typically includes interviews with the landowner, map consultation to determine possible sources of the problem, water sampling for chemical tests and pumping to determine the well's productivity. With the addition of down-hole camera technology, the investigator now has the capability to "see" the inside of the well. Lowering a camera into a well allows scientists to see its rock layers and determine differences in thickness and composition. Previously, the tools available did not provide such precise information.

Domestic water wells that are near underground mines can suffer damage from subsidence. Subsidence is the gradual sinking or abrupt collapse of the rock and soil layers above an underground mine. These shifts can result in significant material and property damage including damaged building foundations and large cracks appearing on hillsides. In most cases, subsidence results in decreased production of the well, although increased production may result in some cases.

A well can provide several clues to show it has been impacted by subsidence. The most obvious is fracturing of the well bore. These fractures are clearly visible on down-hole camera video as near-vertical cracks in the well bore that begin on one side and progress to the other, appearing and disappearing in a "V" pattern. Often, water can be seen either entering or leaving the well through these openings.

Another feature often present in wells affected by mine subsidence is offsets of the well. An offset is motion along a horizontal break in the rock strata. An offset can cause the well diameter to constrict and possibly seal it off entirely. The down-hole camera can clearly display cases in which this has occurred. The camera also shows if any pipes or wires connected to pumps in the well are pinched against one wall, preventing pump removal. Using the camera's video, scientists can distinguish between these and other cases where rocks become lodged in the well (an event that would also make removing the pump difficult).

The addition of down-hole camera technology to the tools used by hydrogeologists at DSMRE has been of great benefit to the proper investigation of groundwater well complaints. In addition, this ability to document the inside of a well has provided the opportunity to view subsidence features not visible on the surface. This has been a tremendous boost to the department's ability to draw accurate conclusions that hold merit with landowners and mining companies.



A collapse in an underground mine causes fragmented rock to fall down into the mine void. The movement creates fractures that travel toward the earth's surface. These fractures can damage domestic water wells. Schematic drawing by Lee Florea

ABOVE LEFT: ***Video camera equipment is set up over a test well.***
ABOVE RIGHT: ***Billy Ratliff, DSMRE, adjusts the light source of the video camera.***
Department for Surface Mining Reclamation and Enforcement photos

Commission dedicates its 40th state nature preserve

By David Skinner
Kentucky State Nature Preserves Commission

A deep, twisting gorge with forests covering its slopes and a showy array of spring wildflowers gracing its narrow valley floor is the newest addition to the state nature preserve system.

The Kentucky State Nature Preserves Commission dedicated the Lower Howard's Creek Heritage Park and State Nature Preserve in Clark County in January. Clark County purchased this 244-acre tract with money from the Kentucky Heritage Land Conservation Fund. It is the third state nature preserve on county-owned property.

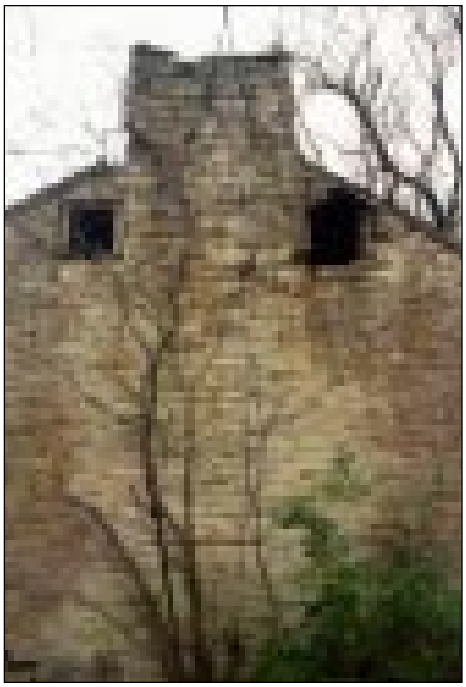
The steep topography of Lower Howard's Creek serves as a refuge for two rare plants, the federally endangered running buffalo clover (*Trifolium stoloniferum*) and the water stitchwort (*Stellaria fontinalis*), which is on the state's list of endangered species.

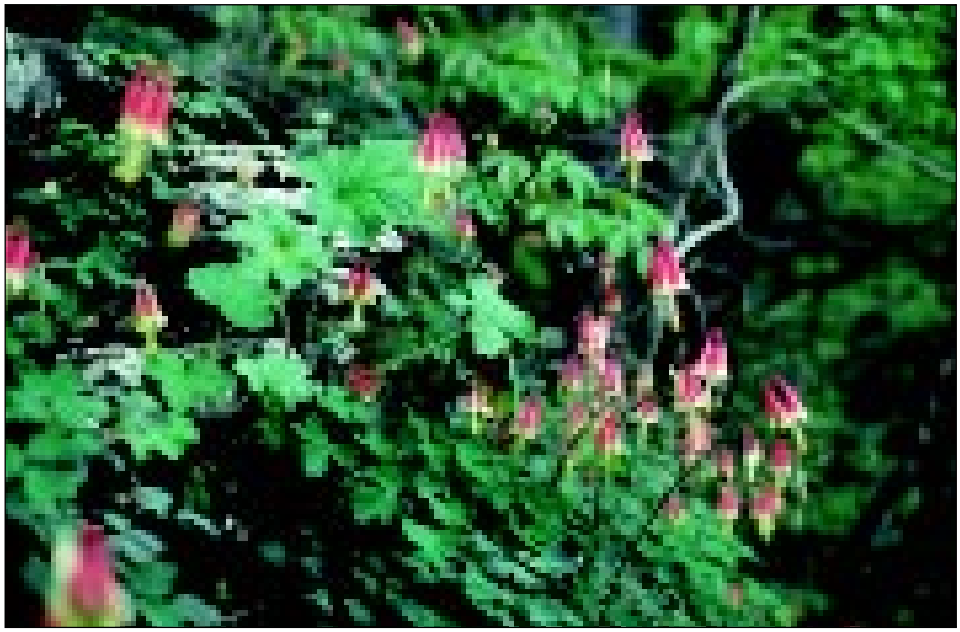
The dedication of Lower Howard's Creek Heritage Park and State Nature Preserve will allow the area to be protected and recognized for its natural and cultural significance. The acquisition also provides for the protection of rare native species and ecological communities. Preserves are managed to enhance and perpetuate these elements of biodiversity and are protected by the highest form of statutory land protection available in Kentucky. The Kentucky State Nature Preserves Commission will work with the Friends of Lower Howard's Creek to manage the property.

Located downstream from Boonesborough, the Lower Howard's Creek Valley was an industrial center for water-powered stone milling during the 18th and 19th centuries. Five stone buildings that remain on-site are on the National Register of Historic Places. Hikers walk the historic wagon road winding down into the steep, forested gorge and can still see rock fences and the remains of the mill race that powered one of the mills. Presently, access is by guided hike only.

"It is an excellent combination of the historical and biological treasures of Clark County and will be a great resource for the public," said Donald Dott, Jr., executive director of the Kentucky State Nature Preserves Commission.

Clark County Judge-Executive Drew Graham echoed those sentiments. "This investment will ensure an area of Clark County will be preserved and protected for the benefit of generations to come," he said. "Whether it be tours given to interested tourists or educational trips made by school children, the preserve will enable interested parties to study certain endangered species, historical buildings, old mills, archaeological sites and the natural history of the Kentucky River Valley."





LEFT: ***A stone building that remains on the property.*** Photo by Robert M. Polsgrove, Kentucky Trust for Historic Preservation

ABOVE: ***Columbine (*****Aquilegia canadensis*****) can be found in the Lower Howard's Creek vicinity.*** Kentucky State Nature Preserves Commission photo

Results of inventory are cause for concern

By Martina Hines
Kentucky State Nature Preserves Commission

This community is a Cypress/Tupelo swamp in Ballard County, Kentucky.
Photo by Nick Drozda, Kentucky State Nature Preserves Commission

While Kentucky appears lush and diverse, it has very little in common with the Kentucky that Europeans first encountered 250 years ago. Most forests have been cut repeatedly and have lost much of their original diversity. Nearly all of Kentucky has been heavily invaded by, and often purposefully converted to, exotic species as a result of clearing and draining of lands and the subsequent expansion of agriculture. Natural communities today form only tiny fractions of the landscape.

A natural community is a group of plants and animals that live in a certain kind of naturally occuring habitat. For example, a cypress swamp contains bald cypress trees, cottonmouth snakes and other water-loving plants and animals that you wouldn't find on top of a mountain.

For 25 years, the Kentucky State Nature Preserves Commission has been conducting an inventory to determine what natural communities still exist in the Commonwealth. After surveying 74 counties, researchers have discovered about 20,700 acres of intact or nearly intact natural communities; this is equivalent to about 0.08 percent of the total area of Kentucky. Most natural communities are on lands that are unsuitable for either agriculture or development, such as steep slopes, rock outcrops with poor soils and wetlands. Nearly three-fourths of all fairly intact natural communities are forested.

While most forest types are still common in Kentucky, undisturbed or high-quality tracts with diverse flora and fauna are extremely rare. Old-growth forests have nearly disappeared from Kentucky, and so far we have been able to identify only about 15,000 acres of older growth or unmanaged forest in Kentucky. This is equivalent to approximately 0.1 percent of the total forested area in Kentucky (which is about 50 percent or 13,000,000 acres of the state's total area). These forests, which are highly diverse and complexly structured, are ecological gems that provide a glimpse into what Kentucky might have looked like before the arrival of Europeans.

Old-growth forests have nearly disappeared from Kentucky.

Other seriously imperiled communities include Kentucky's prairie and glade systems. Only about 1,200 acres have been identified so far. At the time of European settlement, 2.5 to 3 million acres of prairies and glades are thought to have existed.

Of all known high-quality, natural communities, a total of only about 2,600 acres (about 13 percent) are fairly well protected. An even smaller fraction is permanently protected in the form of nature preserves. We are trying to protect remnants of all known natural communities in Kentucky, but unfortunately about 30 percent are not protected anywhere in the state.

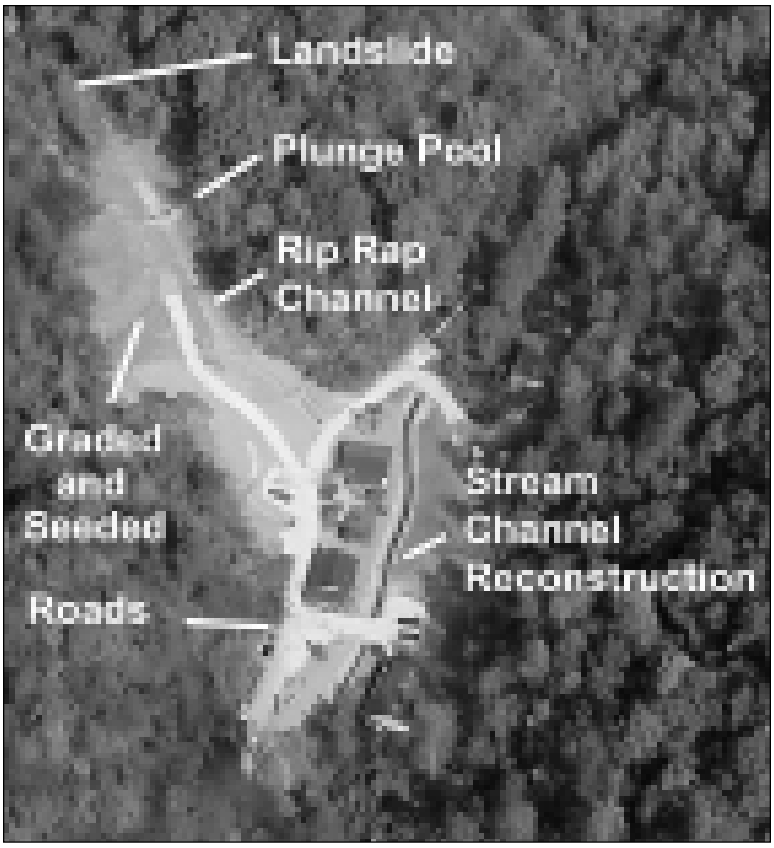
Forty-six of Kentucky's counties have still not been surveyed systematically, but the results of recent inventories indicate that the chances of finding more high-quality communities are very slim. In the 10 most recently surveyed counties, we have found no remnants of old-growth forest and only a few small tracts of fairly mature forest. We have also discovered a handful of glade and barren remnants, but few are large and diverse enough to justify protection with limited state resources.

In addition, a number of high-quality, irreplaceable tracts that the commission tried to protect have been destroyed. Among the victims are two highly mature and diverse forests on Pine Mountain and a near old-growth forest in Jackson County. Every year, important sites that have been identified as significant ecological resources are lost to other uses. In the 46 Kentucky counties that have never been surveyed, remnants of natural communities, no doubt, are being destroyed before we ever discover them.

Continued on Page 19

The Kentucky State Nature Preserves Commission (KSNPC) is a state agency created in 1976 and directed by five citizens appointed by the governor. KSNPC's mission is to protect Kentucky's natural heritage by identifying, acquiring and managing natural areas that represent the best known occurrences of rare native species, natural communities and significant natural features in a statewide nature preserve system; working with others to protect biological diversity; and educating Kentuckians as to the value and purpose of nature preserves and biodiversity conservation.

Dangerous situation eliminated by Division of Abandoned Mine Lands



By Phillip Bowling
Department for Surface Mining Reclamation and Enforcement

A thick wall of mud and debris lodged against the side of a home in Chavies, Ky., prompted a citizen's urgent call to the Division of Abandoned Mine Lands (AML). The landslide, also threatening two other homes in the Perry County town, was linked to "auger mining" (see box on Page 8) that occurred decades ago. The division works throughout the state's coalfields to protect the public from health and safety problems that result from mining that occurred prior to 1982.

Charles Mills, an engineer in the AML's Design Branch in Frankfort, and London Regional Office inspectors walked the hillside behind the affected homes to examine the scope of the environmental damage. The homeowners provided the needed history behind the nature of the problems.

Mills, who designs plans to solve such problems, learned that during the past few years mud and water flowed from the area of the landslide during the wettest times of the year; during dry weather, the area was stable. "We observed an area of about eight acres that was being impacted by the old mine works," Mills said. "Water seeping from the auger holes in the #7 coal seam was saturating the old spoil material and also the original soil on the hillside, creating an imminent danger situation for the homes below."

Mills and Bob Scott, AML's environmental engineering branch manager, designed a plan to eliminate the dangerous conditions. With the help of a watershed-modeling computer program, the pair designed waterways capable of handling runoff from a 100-year-category storm. "The plan was to create a serviceable, long-term solution for keeping the water and mud out of these people's homes," said Mills.

The AML works throughout the state's coalfields to protect the public from health and safety problems that result from mining that occurred prior to 1982.

Alpha Reclamation Service of Pikeville, Ky., began the field work by creating a 300-foot channel of rock rip-rap between the bottom of the landslide and the threatened homes. The contractors then built a plunge pool, a sediment control structure that detains the rapid flow of runoff and prevents mud from reaching the homes. Workers built the structure so that a backhoe could clean out debris as needed.

Two smaller "gabion basket" dams were built to slow the water from the plunge pool prior to its confluence with a stream in the area. A gabion basket is a heavy-gauge, galvanized wire basket filled with limestone rock. When several baskets are connected, the weight and mass create a strong structure. The porous nature of the basket allows the water flow to be controlled and the coating on the wire ensures a long service life.

Mudflow wasn't the only threat to area residents. Stream bank erosion and silt from the landslide impacted a stream near

ABOVE: ***An aerial view of the completed project.*** **RIGHT:** ***View looking upstream at the plunge pool, designed to control a 100-year storm.*** Photos provided by the Department for Surface Mining Reclamation and Enforcement

What is auger mining?

Auger mining is a technique where the coal is removed by boring holes horizontally into the coal seams. During the 1950s and 1960s, this type of operation was quite common.

Generally, only a small disturbance is cut into the earth to expose the coal, and the holes are drilled 100-150 feet into the hill. Today, "augering" is done only after contour mining has reached the limit of the surface disturbance. The spacing and size of the holes are engineered to ensure stability of the mined area. This technique allows the miner to maximize recovery of the coal reserves.

For more information on different methods of mining, visit this Web site **http://kydsmre.nr.state. ky.us/dsmremay13/surface_coal_mining_methods1.htm**

the homes, putting the families in danger of flash flooding. Contractors removed the sediment and restored the stream banks using gabion baskets to control erosion and enhance water flow.

Finally, all disturbed areas were seeded and mulched, and workers completed their task at a cost of about $150,000. AML employees will continue to inspect the landslide area, but it appears to be stable.

One of the affected residents, Tommy Johnson, summed up the success of the project: "I sleep better at night without worrying about the mud."

An interesting note to this story is that present-day mining methods may provide long-term stability to the landslide area. Workers at the Pine Branch Coal Sales mine, located adjacent to the affected area, are removing the #7 coal seam using today's surface mining method of operation. The mine is using an erosion control plan that requires miners to construct a waterway to divert surface water runoff around the landslide area. Removal of the coal seam will eliminate the old auger holes, reducing seepage into the slide area. Should any additional work be needed, the Division of Abandoned Mine Lands will be ready to lend its expertise.

FRONT ROW, FROM LEFT: ***Winners Skyler McDaniel, Brandon Muncy and Jessica Nix.*** **BACK ROW, FROM LEFT:** ***First Lady Judi Patton, Secretary James Bickford and Roy Palk, president and CEO of East Kentucky Power Cooperative (EKPC). EKPC provided award certificates, poster contest kits and promotional materials for this year's contest.*** Photo by Timothy Thornberry, Creative Services

Winning artists spread the word: spring clean Kentucky

By Heather Frederick
Public Information and Education Branch

Three young people won statewide honors in March for the artistic way they reminded Kentuckians to clean up their state. Natural Resources and Environmental Protection Cabinet Secretary James E. Bickford and First Lady Judi Patton recognized the winners of the 2001 Commonwealth Cleanup Week Poster Contest at a ceremony in Frankfort. Each winner receives a $150 U.S. savings bond, a t-shirt and a certificate of appreciation.

The students' artwork promotes Commonwealth Cleanup Week, a statewide event that brings people together to remove trash from roadsides, illegal dumps and waterways.

This year's statewide poster contest winners are:

- ★ **Grades 1-2: Skyler McDaniel, Owingsville Elementary, Bath County**
- ★ **Grades 3-5: Brandon Muncy, Stinnett Elementary, Leslie County**
- ★ **Grades 6-8: Jessica Nix, Jefferson County Traditional Middle School**

"We are proud of these young people for using their artistic skills to remind people of the importance of cleaning up Kentucky," Bickford said.

"I want to congratulate the students we are honoring today," Mrs. Patton said. "These young artists have set a great example for all of us to follow. I hope their schools will continue to emphasize the importance of environmental responsibility to our future leaders."

Each student's school received a $1,500 grant for environmental education.

The poster contest is an annual event. Teachers and parents interested in receiving contest information next year can be put on a mailing list by e-mailing **Heather.Frederick@mail.state.ky.us** or writing to Heather Frederick, Natural Resources Cabinet, 4th Floor, Capital Plaza Tower, Frankfort, KY 40601.

In the summer issue of *Land, Air & Water,* we'll look at how people across Kentucky worked to make our state more beautiful during Commonwealth Cleanup Week, March 24-31, 2001.

Natural area purchases fulfill dreams

By Mary Jean Eddins
Department for Natural Resources

Twenty years ago, when Hugh Archer was working as executive director of the Kentucky chapter of The Nature Conservancy, he had dreams of purchasing and protecting as many significant natural areas in Kentucky as possible. While Archer was able to negotiate for the protection of numerous sites across Kentucky, two in particular got away from him. They were at opposite ends of the state, one in Harlan County and the other in Fulton County. But they were joined, at least in Archer's mind, by their significance as natural areas.

As years passed, Archer became chair of the Kentucky State Nature Preserves Commission, then executive director of the Kentucky River Authority. In 1998, he was appointed commissioner of the Department for Natural Resources. As commissioner, Archer automatically became a member of the Kentucky Heritage Land Conservation Fund Board (KHLCFB), which awards grants to state agencies, state colleges and universities, and local governments for the protection of significant natural areas and wildlife habitat.

A number of other individuals and groups had long recognized the importance of the two sites Archer wanted to acquire. In January 1998, the Kentucky Department of Fish and Wildlife Resources submitted a grant application to the KHLCFB for more than $1 million for the purchase of Emerson-Letourneau Woods in Fulton County, one of Archer's coveted sites. Heritage Land funds, combined with grants from several other sources, allowed for successful negotiations for the purchase of the property. Since board members were familiar with the woods, they quickly approved the project.

In July 1999, the Kentucky Division of Water's Wild Rivers Program submitted a grant application for funds to purchase the site Archer had targeted in Harlan County. Croushorn Woods contained more than 1,500 acres on the Martin's Fork of the Cumberland River. This purchase helped protect one of the most pristine waterways in the Commonwealth. Once again, the board was enthusiastic about supporting such an endeavor and unanimously voted to award more than $1.2 million for the purchase, protection and management of the property.

But the story doesn't end there. The next stage of the game consisted of long and tense negotiations with the property owners, appraisals and surveys. Key negotiators Charles Bush and Art Boebinger (Department of Fish and Wildlife Resources), Morgan Jones (Division of Water's Wild Rivers Program) and George Clarke (Division of Real Property), would spend the next several years working on acquiring these properties.

Finally, in December 2000, the efforts of these and countless other individuals paid off. Within days of each other, the Kentucky Department of Fish and Wildlife Resources bought Emerson-Letourneau Woods and the Division of Water acquired Croushorn Woods. Two pieces of land totaling almost 2,400 acres will now remain reminiscent of what early settlers in Kentucky would have seen. Archer was jubilant. "It is a miracle that these areas survived development since they were first identified," he said. "It is extremely satisfying for me to see these unique places set aside since they have been a concern of mine for most of my adult life."

Croushorn Woods

The four tracts purchased by the Wild Rivers Program have been in the Croushorn family for many years. Prior to purchase, the tracts constituted one of the largest privately owned areas within the Martin's Fork Wild River Corridor. The tracts contain more than two stream miles of the Martin's Fork Wild River. A wild river is a river or river segment containing waters that are free flowing and not polluted beyond feasible correction. Wild rivers also feature scenic vistas and shorelines that are essentially primitive and unchanged and opportunities for wilderness-type recreation which would not disturb the primitive character of the river.

The Croushorn woods encompass a wide variety of landforms and terrain, from streamside boulder gardens and lush hemlock groves, to the rocky, windswept Cumberland Mountain ridge on the Kentucky/Virginia border and the broad, flat ridgetop of Brush Mountain. Only after biological inventories are conducted will the true ecological significance of the site be realized.

"This purchase will ensure the permanent protection of this rugged and beautiful mountain area and help maintain the water quality of the wild rivers portion of Martin's Fork," said Morgan Jones, Division of Water negotiatior. "The tracts will be managed to protect the natural features and native plants and animals that live there, while still providing for low-impact appropriate public use of the area."

"I enjoyed negotiating this tract because I really wanted to see it preserved," said negotiator George Clark from the Division of Real Property. "I will be proud to someday take my grandchildren to both the Letourneau and Croushorn acquisitions and explain the small part I played."

BACKGROUND AND ABOVE: ***Emerson-Letourneau Woods is full of tall, mature trees that support large numbers of migrating waterfowl, shorebirds and neotropical songbirds.***

UPPER RIGHT: ***Martin's Fork Wild River on the Croushorn property in Harlan County.***

UPPER LEFT: ***Kentucky Heritage Land Conservation Fund Board members and agency staff visited Emerson-Letourneau Woods in October 1999.***

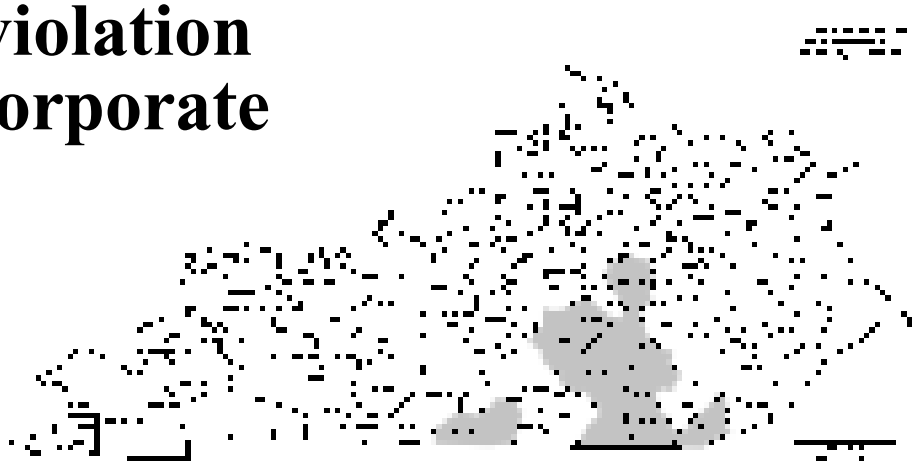
All photographs courtesy of the Kentucky Heritage Land Conservation Fund Board

Emerson-Letourneau Woods

Emerson-Letourneau Woods, known locally as Thousand Acre Woods, is one of the best remaining examples of high-quality bottomland forest in the lower Mississippi Valley. The tract is a natural wetland that supports large numbers of migrating waterfowl and shorebirds, as well as locally breeding and migrating neotropical songbirds. Neotropical migrants are dependent on mature hardwood forests of significant size for essential nesting and brood-rearing habitat. The birds also use these forests as critical resting and refueling "stopover" sites that provide cover and food during their migration. In addition, federally threatened bald eagles have been sited on an adjacent parcel of land and likely use the Emerson-Letourneau Woods significantly. Biological inventories will tell us more about the status of the eagles as well as migratory animals and plant life.

"I first visited the 'Thousand Acre Woods' around 1978 and was struck that I had entered a very special place," said negotiator Art Boebinger of the Kentucky Department of Fish and Wildlife Resources. "To be in on the acquisition and protection of such a unique part of Kentucky's landscape is the pinnacle of a career dedicated to acquiring land for the enjoyment of future generations of Kentuckians."

Environmental violation results in good corporate citizenship



By Matt Hackathorn
Division of Waste Management

In Kentucky, companies that violate environmental regulations sometimes receive an opportunity to make amends by financing projects designed to clean up the Commonwealth. A Supplementary Environmental Project (SEP) offers a positive outcome for both the state and the offending company. Somerset Refinery Inc. of south central Kentucky is a fine example of how SEPs can work.

Somerset Refinery Inc. recently spent $200,000 to remove 45 underground storage tanks (USTs) from 18 sites across 11 Kentucky counties. The company conducted the tank removal as part of a penalty imposed by the U.S. Environmental Protection Agency (EPA) for disposing of refinery byproducts (or sludge) on its property without a hazardous waste disposal permit. The company conducted the tank removals on sites owned by others.

"The tank removal project was just one stipulation in the cleanup plan that Somerset Refinery Inc. and the EPA agreed on in 1997," said Jerry McGinnis, project specialist for Somerset Environmental Services Inc., the SEP's primary contractor. "They're also required to clean up their property and monitor the soil and groundwater for contamination."

Underground storage tanks are used to hold petroleum products like gasoline, fuel oil and jet fuels. Older USTs, built before stricter federal regulations took effect, are often removed to prevent petroleum from leaking from the tanks.

The U.S. EPA, the Kentucky Department for Environmental Protection and Somerset Refinery Inc. negotiated several criteria for selecting the sites to receive free tank removal. Each site had to be within 50 miles of the refinery or one of the refinery's gasoline outlets, known as Somerset Oil. In addition, the USTs had to be either unregulated by federal or state legislation, or regulated with a product output of less than 12,000 gallons per month and those whose owners had insufficient resources to afford the removal.

Hazardous Waste Branch Project Manager Bart Schaffer said the project offered a win-win situation for southern Kentucky and the refinery. "The citizens of Kentucky now have a cleaner environment, and Somerset Refinery Inc. was able to pay for a portion of its penalty at a reasonable expense," he said.

Counties involved and number of tank removals:

Bell County -- 1
Casey County -- 1
Cumberland County -- 1
Laurel County -- 4
Lincoln County -- 2
Madison County -- 1
McCreary County -- 1
Monroe County -- 1
Pulaski County -- 4
Rockcastle County -- 1
Whitley County -- 1

The Underground Storage Tank (UST) Branch of the Division of Waste Management regulates the registration, compliance, closure, inspections and corrective actions of UST systems. The branch aims to prevent and stop the release of contaminants from USTs in order to protect human health, safety and the environment. To learn more about the UST branch, visit **http://www.kyenvironment.org/nrepc/dep/waste/programs/ust/usthome.htm** on the World Wide Web.

KENTUCKY STATE FAIR

The Kentucky State Fair plans to present a series of environmental themes over the next few years to give fairgoers a chance to learn about the world around them. The first theme in the series is *2001: A Water Odyssey*. (Next year's theme will be *2002: A Land Odyssey.*)

A Water Odyssey will include a living stream, interactive exhibits and learning lab programs that visitors of all ages can use to learn more about Kentucky's history and geography, aquatic biology and water quality.

The Kentucky State Fair will run from Aug. 16-26, 2001. To find out more about the exhibit, check out the state fair's Web site at **http://kyfairexpo.org/statefair/index.html** and click on "Educational Exhibit." Also, look for additional information about the cabinet's participation at the fair in the summer issue of *Land, Air & Water*.

A facility that once built war weapons is now the target of an extensive cleanup effort. The Kentucky Department of Environmental Protection (KDEP) is overseeing the removal of soil and groundwater contamination at the former U.S. Navy industrial park in Louisville, which was known as the Naval Ordnance Station.

Cleanup aims to increase business at technology park

By Matt Hackathorn
Division of Waste Management

TOP: ***An environmental crew member cleans up around a pipe that excavators hit while digging up contamination at the industrial park.***
RIGHT: ***Crew members cleaned and pressure washed about two miles of concrete-lined surface runoff ditches at the site.***
Photos courtesy of the U. S. Navy

The cleanup is operating in conjunction with a program designed to transform the area into a private industrial area known as the Technology Park of Greater Louisville. The Navy hopes to transfer ownership of the 144-acre property to the Louisville/Jefferson County Redevelopment Authority (LJCRA) by 2003.

The ordnance station was designated for closure under the Base Realignment and Closure Act (BRAC) in 1995. Former President Clinton urged communities to use the BRAC bases, and in 1996, Navy operations at the park were turned over to private contractors in response to a community proposal. Louisville's Technology Park is the first Navy BRAC site to have its operations "privatized." The goal of LJCRA is to retain defense-related jobs at the facility and to create new employment opportunities for the surrounding community.

Operations began at the Naval Ordnance Station during the World War II-era when the Navy began mass production, machining and assembly of weapons and ordnance to support the war effort. Those operations required the handling and storage of hazardous materials and wastes at the site, resulting in leaks and spills that contaminated both soil and groundwater.

"We believe that much of the contamination we're seeing came from poor housekeeping practices of the past," said Tony Hatton, a state cleanup coordinator with the Division of Waste Management's Hazardous Waste Branch. "Most of the contamination consists of volatile and semi-volatile constituents, primarily resulting from the use of solvents and cutting oil. Heavy metals such as lead and arsenic are also present in certain areas. The majority of the cleanup will involve digging up the contaminated soil and replacing it with clean fill material."

Hazardous Waste Branch employees Tony Hatton and Bill Holskey began working with representatives from the Navy, the U.S. Environmental Protection Agency (EPA), LJCRA and environmental contractors in September 1999 on the first stages of cleanup at the park. The Navy first targeted a few selective "hot spots," or highly contaminated areas, by excavating contaminated soil, replacing it with clean material and capping it with gravel or concrete. During the summer of 2000, the Navy increased its cleanup effort by addressing more marginally contaminated areas. That effort is ongoing.

Navy Remedial Project Manager Jeff Adams said he was pleased with the cooperation between all stakeholders. "The upfront teamwork between KDEP and the Navy provided timely and technically sound decisions that ultimately resulted in good management of taxpayers' money," he said. "By listening to each other, team members are able to reach decisions that address the concerns and requirements of all stakeholders. This creates ownership of the project for everyone and a true commitment to success."

"We are looking forward to when a final agreement is reached on the remediation measures to be undertaken and when the Redevelopment Authority obtains title, both of which will enhance the marketability of the property," said Ted Sauer, president and executive director of the Technology Park of Greater Louisville.

In December, United Defense, one of the major tenants of the park, started production of a new weapon system to be used for new Navy destroyers. Once regular production starts in 2004, the project could bring in approximately $2 billion of work to United Defense over a 15- to 20-year period.

Mapping system offers new look at state's plants, forests and mine sites

By Heather Frederick
Public Information and Education Branch

How many large parcels of forest are in Kentucky? Which mining inspector is assigned to a site that needs to be investigated? The use of Geographic Information System (GIS) technology is answering these questions and many more in the Natural Resources and Environmental Protection Cabinet (NREPC).

GIS allows users to combine various "layers" of data into maps that provide the specific information an agency needs. It also allows various divisions of the NREPC to see existing data in a whole new light.

About the agencies...

The Kentucky State Nature Preserves Commission works to protect biological diversity and educate Kentuckians about it. It also acquires and manages areas that are home to rare native species and significant natural features.

The Department for Surface Mining Reclamation and Enforcement enforces Kentucky's mining, reclamation and abandoned mine land laws to protect its citizens, environment and natural resources.

The Kentucky State Nature Preserves Commission believes it will reap many benefits from the use of GIS. The commission is using it on several projects, including an examination of nine rare plant species and a look at large blocks of forest in Kentucky.

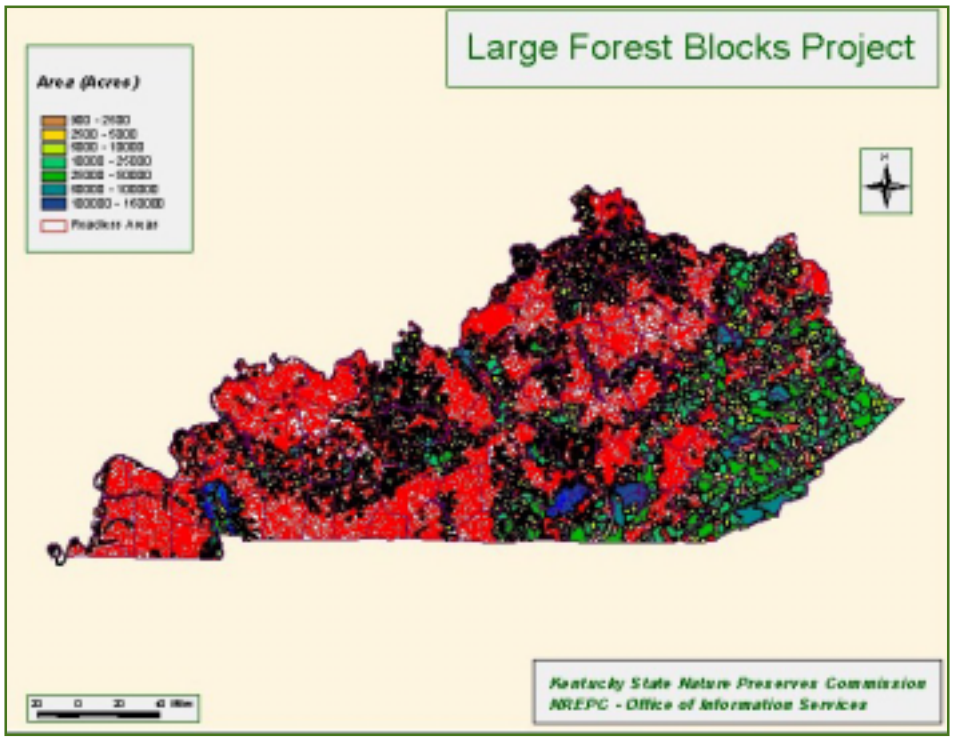
The U.S. Fish and Wildlife Service (USFWS) provided the commission with a grant to conduct the rare plant habitat modeling project. Its goal is to predict where potential habitats for rare plant species may be found in the Commonwealth. The USFWS plans to use the information to determine whether rare plants could be located in areas where construction is proposed. The commission will use the GIS-generated information to identify potential sites it might want to target for further field studies.

The commission is using GIS layers such as geology, soils and land cover to identify areas in the state where environmental conditions are right for each of the rare plant species targeted in the USFWS study.

Take, for instance, a rare plant known from central Kentucky, Eggert's sunflower. Commission botanists knew that this species: 1) occurs along forest edges; 2) is associated with karst topography (areas where limestone is susceptible to erosion—found in areas where caves and sinkholes are common); and 3) occurs within elevation ranges of 600-930 feet. GIS layers were developed and combined to identify sites that meet all three of these criteria. Areas meeting only two of the criteria received a lesser "score," and some areas of the state are entirely eliminated.

"Because layers are still generalized, particularly geology and soils, this technique has a general application," said Deborah White, senior botanist. "As soils and geology become more finely digitized, the use of this technique will definitely increase. We expect GIS to be very, very useful as more data layers become available. It will be a very important tool in the future in identifying important habitat and areas where we need to survey for rare species."

Commission employees are also using GIS technology to map the locations of large tracts of forest in the Commonwealth. This is important because many species, such as black bear and some migratory songbirds, require large expanses of unbroken forest to survive. To help protect these species, the commission needs to determine where the largest



Maps courtesy of the Office of Geographic Information Systems (GIS)

contiguous tracts of forest in Kentucky are. Before its acquisition of GIS, the commission found this an almost impossible task because it would require combining data from more than 700 topographic maps of Kentucky. "I realized it would take me probably that many years to get it done," said Marc Evans, senior ecologist.

Recently, Evans accessed a computerized base map that shows vegetative cover across the state, added a "layer" that shows Kentucky roads and asked the computer to find all large blocks of forested areas not fragmented by roads. He also specified a minimum acreage for those tracts: a 5,000-acre minimum in eastern Kentucky and a 1,000-acre minimum for the rest of the state. He came up with 2,218 forest blocks meeting those criteria.

"One thing it doesn't tell us is the quality of forests," Evans said. "The next step will be a method of elimination for 'quality controlling' the forests blocks...looking at size, quality, internal disturbances and internal roads within each block. The best forest blocks are those that have few or no internal roads, haven't been recently disturbed and have an intact canopy."

Evans won't rely strictly on what the GIS maps show him. He will use a helicopter to conduct an aerial survey to make sure the forests haven't recently been disturbed. He'll use the information he gathers in the air to determine which sites to visit on the ground.

"After we determine the largest and best blocks, we will treat them like we would rare species and communities... monitor and track them," Evans said. "Tracking will help us to determine the rate of fragmentation (rate at which large tracts are being broken into smaller ones). This will give us hard data and help us in the long run also with long-range planning for Kentucky."

Since some plants and animals have trouble migrating when they're on landlocked, isolated forest blocks, the Kentucky State Nature Preserves Commission would like to eventually come up with a plan of greenways across Kentucky that would connect these blocks of forests.

"I can't emphasize enough that without GIS, we couldn't do it," Evans said. "It would've taken probably 50 years to do it, so I'm thrilled with this. It's going to fill in a big gap of data that we had here."

The Department for Surface Mining Reclamation and Enforcement (DSMRE) is also reaping the benefits of GIS. The department has improved its customer service by utilizing the new technology.

For example, if a citizen calls in a complaint about a mining site to one of the department's regional offices, the staff can use GIS-based software to determine which inspector is assigned to that particular mining permit. GIS provides DSMRE employees with maps that show each mine in their region. Employees can search the maps to find roads, streams and specific towns a citizen might refer to when calling in a complaint. Then they can zoom into the area on the map, which will be color-coded to show which inspector handles it. The staff can also search the maps by permit number or the name of the mine.

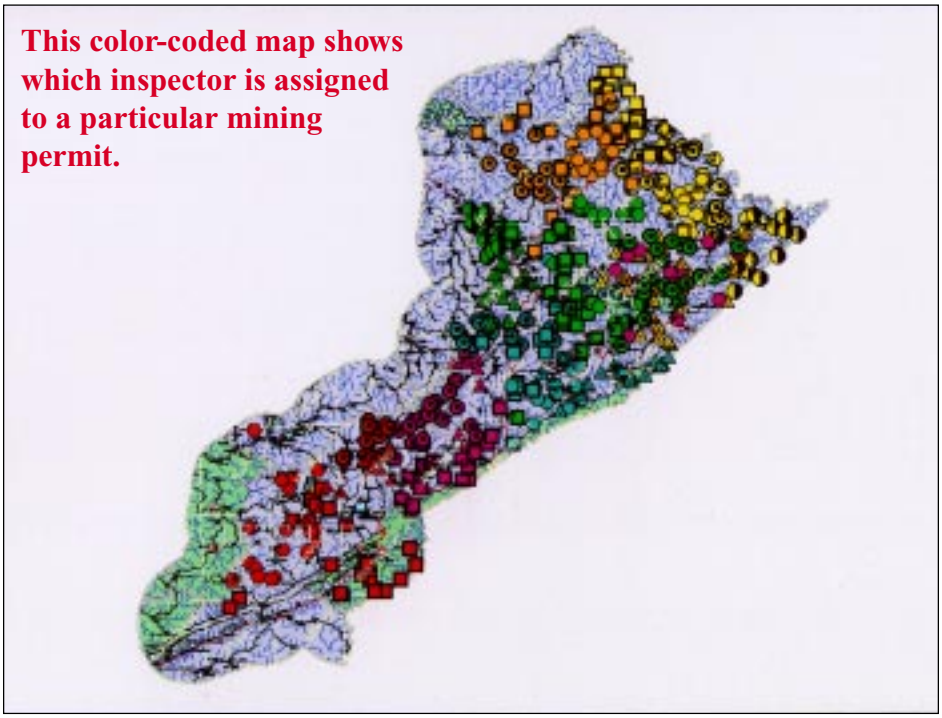
In the field, inspectors can access a GIS software package on laptop computers. With compact discs, they can call up topographic maps of mines and display roads, wells, cemeteries, schools and other active mines in the area. They can create "layered" maps with the specific features they want to display. Those features can include mines assigned to other inspectors. "It organizes the data into a convenient package," said Daryl Hines, DSMRE geoprocessing specialist. "It's easy to overlay one set of data onto another on the laptop versus keeping track of different paper maps. When the data changes, we can update it and send out new CDs."

The use of GIS technology in DSMRE isn't limited to inspections. DSMRE permitting staff use GIS to view mine permit boundaries, topographic maps, aerial photos and satellite imagery. This allows them to quickly verify and process application data.

GIS technology is also used extensively to conduct special studies (slurry impoundments, groundwater investigations, etc.) and to produce custom maps.

The EMPOWER Kentucky program provided some of the funding for the use of GIS in DSMRE. EMPOWER Kentucky is Gov. Paul Patton's initiative to make state government more efficient and effective by streamlining how services are delivered to Kentucky taxpayers.

DSMRE and the Kentucky State Nature Preserves Commission aren't the only areas of the cabinet putting GIS to work. In our next issue, we'll show you how forest fires, oil and gas facilities and septic systems are linked to the use of this technology.



This color-coded map shows which inspector is assigned to a particular mining permit.

Clearing the air on emissions testing

By Parker Moore
Division for Air Quality

Vehicle emissions testing has received lots of media attention in Kentucky. One of the most common complaints citizens make is that they don't see the need for the testing. Here's a look at that issue and answers to some other questions asked by citizens of the Commonwealth.

1 Why is the testing only required in certain parts of the state?

These areas have exceeded the federal government's limits on ozone (smog) levels. The federal Clean Air Act requires states to reduce ozone-forming emissions in such areas by 15 percent. High levels of ozone may be harmful to children, the elderly and people with respiratory problems.

2 What's the main idea behind this testing?

Motor vehicles account for a significant percentage of ozone-forming emissions. Identifying vehicles that pollute excessively and requiring their repair can cut these emissions up to 50 percent and improve ozone levels, according to the U.S. Environmental Protection Agency.

3 Why not eliminate newer vehicles from the testing?

Newer vehicles have much lower fail rates, but their emissions-control equipment can still malfunction for various reasons, including faulty manufacture, faulty installation, damage and improper maintenance. The emissions test will identify such malfunctions, even when they are not noticeable to the driver, and in most cases, the repair will be covered under the vehicle's warranty. Even a fail rate as low as 1 percent translates to 750 malfunctioning new vehicles in Northern Kentucky's vehicle population of 200,000.

4 What is the main reason vehicles fail?

Most failures are the result of vehicles not regularly undergoing simple maintenance such as a tune-up.

Exhaust probes collect a sample of emissions and send it through a tube to an analyzer to determine concentrations of hydrocarbons, carbon monoxide and carbon dioxide. The exhaust-emissions portion of the test is preceded by an anti-tampering check (to see if emission-control equipment has been removed or disabled) and followed by an evaporative system pressure check (to see if there are leaks in the gas tank, gas cap or charcoal canister).
Division for Air Quality photo

5 When failing vehicles are taken to a mechanic for repair, why do mechanics' exhaust analyses sometimes differ from the testing stations'?

Station equipment is state-of-the-art and is calibrated several times each day. Station staff are fully trained to operate this equipment – it's their full-time job. Additionally, vehicles can have intermittent problems (like sticking chokes or EGR valves) that can cause passing test results one time and failing results later.

6 What would happen if the testing programs were eliminated?

Air quality improvements would be harder to achieve. Elimination of the programs could also make it harder for areas to meet federal air quality standards, resulting in increased respiratory problems and federal restrictions on highway funding and industrial growth.

7 Aren't there other ways to reduce emissions besides vehicle testing?

Yes, and many of these methods are already in use in Kentucky. Vapor recovery systems are in place on gas pumps, industrial sites must comply with limits on the amount of ozone-forming emissions they can release, restrictions on open burning are in place, and reformulated gasoline is in use in some areas. In addition, state educational efforts encourage citizens to do their part by carpooling, taking the bus and mowing lawns after 6 p.m. in the summer.

Many members of the public recognize the value of emissions testing and its contribution toward a cleaner environment. Hopefully, this article will help dispel some of the misunderstandings about these testing programs.

If you want additional information on emissions testing, contact the Northern Kentucky Emission Check's toll-free hotline at (877) 291-8787 or the Jefferson County program's toll-free hotline at (800) 928-8389.

Web Watch

New database to be accessible this spring

By Julie Brumback Smither
Public Information and Education Branch

Agencies within and attached to the NREPC produce and distribute lots of publications. We currently have more than 400 in our archives. These reports, brochures, booklets, curriculum materials and videos discuss environmental and natural resource issues such as recycling, water quality, forestry and energy conservation.

This spring, visitors to the NREPC Web site will be able to search the new NREPC Publications Database. At **http://www.kyenvironment.org/nrepc/publications.htm**, you can find the publication you need. Search by topic or even by the field of your work. For instance, a teacher can see a list of those publications pertinent to the classroom, while a newly elected county judge-executive can peruse the list of publications helpful to local officials.

Check it out, and let the NREPC help you find the information you need on Kentucky's environment and natural resources.

New EPA Web site provides info on environmental laws

By Rose Marie Wilmoth
Air Quality Small Business Representative

The U.S. Environmental Protection Agency (EPA) has launched a new, innovative Web site. The National Compliance Assistance Clearinghouse Web site provides instantaneous access to information needed to comply and go beyond compliance with environmental laws. It's goal is to provide vital information to businesses and compliance assistance providers across the country.

The EPA joined forces with its state and tribal partners and other key stakeholders to create this site. Here are some of the special features of the clearinghouse site:

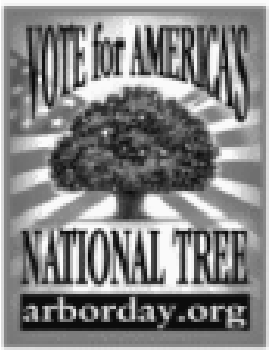
- You can find compliance assistance information by sectors, geographic locations, environmental focus areas and types of assistance tools.
- You can get in touch with experts across the country.
- You can quickly find answers to many frequently asked questions.
- You can find out what others are doing and how you can collaborate.
- You can tell EPA what compliance assistance tools you need to do your job.
- You can add information from your Web sites so others can see what you have done.
- You can keep up to date on the latest information and technologies.
- Most importantly, you can use the information in the clearinghouse on your Web site.

You can be in the center of these activities by visiting the clearinghouse at **www.epa.gov/clearinghouse.**

You can also play a critical role in ensuring that others know about your compliance activities by entering your Web links to the clearinghouse. So, visit the site today!

Cast your ballot online to select a national symbol

By Heather Frederick
Public Information and Education Branch



We hope there won't be any hanging chads, recounts or other controversy in this election. You can cast your vote for America's National Tree online through 11:59 p.m. on Thursday, April 26, 2001.

The National Arbor Day Foundation is sponsoring the voting. "America has the grandest trees on earth — the largest, the oldest, and we think, the most beautiful," John Rosenow, president of The National Arbor Day Foundation, said. "It's time for the American people to select a national tree as an enduring symbol of all of our magnificent trees, and of our natural heritage."

Go to **www.arborday.org** to make your voice heard on this selection. You can select from more than 20 nominees or write in your own candidate. You can view photos and learn more about each nominee before casting your ballot. The deadline for mail-in votes has passed.

"Election" organizers plan to announce the results of the voting on National Arbor Day, which is Friday, April 27.

It's important to note that the voting does not create an official national symbol. The designation of an official national emblem requires legislation passed by Congress. The National Arbor Day Foundation won't lobby to make the winning tree the country's official tree, but it hopes others will encourage Congress to make that selection.

Cultivating our natural resources the "Montessori" way

By Matt Hackathorn
Division of Waste Management

LEFT: ***Volunteers from VMS load the Woodford County solid waste recycling truck.*** **BELOW:** ***Samantha Norman and Jeremy Snyder created a trashcan with a clear plastic front to depict the breakdown of household garbage that goes into a landfill.*** Photos by Matt Hackathorn

Maria Montessori became Italy's first female doctor around the turn of the 20th century. Dr. Montessori made her mark in the world, not as a physician, but as a social scientist studying how children learn and developing a highly effective method of teaching. Today, the Montessori education method is rooted in teaching children respect and love for nature. In Woodford County, Ky., the results speak volumes.

Last fall, the Versailles Montessori School (VMS) for toddler-aged through seventh-grade children received the Governor's Environmental Excellence Award for Environmental Education. The private school earned the award for increasing recycling efforts in Woodford County and educating children and adults alike about the benefits of recycling.

"We received a $5,000 grant from the U.S. Environmental Protection Agency (EPA) in 1998 to implement an educational program focused on recycling and composting," said Peg Snyder, a teacher at VMS who heads the school's recycling effort. "We wanted to make recycling more convenient for county citizens, but the ultimate goal was to teach the children about environmental responsibility."

The school used the EPA funding to create a recycling drop-off center on its campus and to take children on field trips to the Woodford County Recycling Department, the BFI Landfill in Franklin County and the Kentucky State University Research Farm. Two sixth-grade students, Samantha Norman and Jeremy Snyder (Peg's son), were also assigned the task of creating an educational video to encourage others to recycle and compost.

The 11-minute public service video, "The Four R's — Reduce, Reuse, Recycle and Rebuy," stars many of the students at VMS. Students Snyder and Norman wrote, directed, edited and narrated all of the video. The 12-year-old Snyder said editing the video posed the greatest challenge. "We were supposed to get the video edited by a company in Frankfort, but that fell through," he said. "A friend of mine in the Boy Scouts (Woodford County High School student Bryan Dowell) had experience in video editing, and he volunteered to help us. It worked out well because Bryan didn't just edit the video, he taught Samantha and me how to edit as well, and the Woodford County High School Media Department let us use their editing equipment to complete the project."

VMS Administrator Tony Guagliardo said the program helps students make the connection between a school project and issues that affect society. "Obviously, a project like this is good for the environment, but it also instills lifelong habits in these children that they will hopefully pass along to their children," he said.

The combination of the drop-off center and educational video helped boost the recycling efforts at the school from around 18 percent in 1998 to about 56 percent in September 2000. The effort caught the attention of the Department of Environmental Protection, the governor's office and ultimately the EPA.

"The EPA has asked us to compete for an additional $20,000 in grant funds to expand our recycling program," said Mrs. Snyder. "Our goal is to send the video and curriculum to a minimum of 500 schools in Kentucky, with special emphasis on elementary students. We also hope to work with the Kentucky Environmental Education Council to find additional curriculum ideas and sources for schools that want our video and curriculum suggestions."

Snyder said she hopes to attract interest from other schools interested in starting a recycling center. "Having a drop-off center at your kid's school can be very convenient," she said. "If you're taking your kid to school anyway, it's easy to take your recyclables along with you and drop them off."

Training will educate farmers about livestock waste management

By Martin Bess
Division of Conservation

Some large-scale hog farms in Kentucky produce 1.25 million gallons of liquid waste per year. One poultry house on a farm produces 140 tons of litter (waste). A new grant offers the Kentucky Division of Conservation the chance to develop and provide statewide training on how to manage this waste effectively.

If hog waste leaks from a lagoon, or rain saturates uncovered poultry litter, runoff and water contamination can result. There's also a runoff risk when this manure is used as fertilizer. But if properly handled, the waste can serve as an effective crop fertilizer that provides a cheaper alternative to commercial fertilizers.

A grant from the U.S. Department of Agriculture will allow the Division of Conservation, through coordinated efforts with other state and federal agencies, to train agriculture professionals on the development and implementation of nutrient management plans. These plans will contain tools for designing effective animal waste handling and utilization systems. After training, the agriculture professionals will guide farmers in developing and using nutrient management plans.

"Ultimately, farmers will receive better information about nutrient management planning, including budgeting crop nutrient needs, timing and methods of nutrient application, and environmental risk assessment," said Steve Coleman, director of the Division of Conservation.

According to the Kentucky Agriculture Statistics Service, Kentucky has more than 90,000 farms. The state's farmers are being challenged to use new approaches for designing and implementing nutrient management plans. "Farmers in Kentucky must develop and implement an agriculture water quality plan by October 2001," said Coleman. "Farmers who apply fertilizer or manure to their crops must incorporate a nutrient management plan into their agriculture water quality plan. This training will ensure that farmers get the quality assistance needed to meet the nutrient management planning needs."

This project is designed to provide the needed training and support during a two-year period. More than 210 county agents, USDA district conservationists and Division of Conservation technicians attended the first series of training in November 2000. Future training is planned for the summer and fall of 2001. A Web site to supplement the training is also under development.

This project will "train the trainers" and help them better understand the issues and options associated with management of excess manure/litter and plant nutrients.

Farmers in Kentucky must develop and implement an agriculture water quality plan by October 2001.

Livestock in Kentucky as of Jan. 1, 2000:

2.25 million cattle and calves
460,000 hogs and pigs
5.65 million chickens

Agencies supporting the training are:

- √ University of Kentucky Cooperative Extension Service
- √ Natural Resources Conservation Service (USDA)
- √ Kentucky Division of Water
- √ Kentucky Division of Conservation
- √ Kentucky Department of Agriculture

This photo shows the results of the improper land application of swine waste as fertilizer on farmland. The result here is eutrophication of the stream (growth of algal mass on the stream surface). Photo courtesy of Peyton Adams, Department for Environmental Protection

Opportunity to recognize air quality stewardship

By Rose Marie Wilmoth
Air Quality Small Business Representative

"I want to commend the state and the Air Quality Small Business Panel. The Air Quality Stewardship Award Program is a positive, proactive approach."

Scott Wells, Wells Ready Mix and Pikeville Ready Mix Inc., 1998 winner of Small Business Air Quality Stewardship Award.

"People talk about the cost of environmental compliance. It actually pays. It gives me peace of mind."

Don Snow, All-Rite Ready Mix Concrete Inc., 2000 winner of Small Business Air Quality Stewardship Award.

Purpose of Award

Comments like those are just one of the reasons the Air Quality Small Business Panel has continued its awards program for the fourth consecutive year. The panel is once again accepting nominations for its 2001 Small Business Air Quality Stewardship Awards to recognize small businesses that have shown a commitment to reduce their operations' impact on air quality.

The annual awards acknowledge exemplary performance in one or more of the following areas: pollution prevention, reducing emissions, emission control and/or community air quality leadership.

Who May Nominate?

Individuals, businesses and organizations may nominate themselves or others for this award. A committee of advisory panel members will evaluate the nominations and select a winner or winners.

Nomination Forms

Nomination forms are available by writing to Bobbie Malmer, Commissioner's Office, Department for Environmental Protection, 14 Reilly Road, Frankfort, KY 40601 or calling (502) 564-2150. Nomination forms may also be printed or completed online by accessing **http://www.nr.state.ky.us/nrepc/dep/smbizair/award.htm.**

Deadline for 2001 Award

All nominations must be received in the Commissioner's Office, Department for Environmental Protection at the above address no later than **June 30, 2001.**

Kentucky announces grant recipients for 2000

Continued from Page 3

- **Appalachian Focus Inc.**, Bell County, for Partnership for Pollution Control.
- **Jackson Purchase RC&D**, for Pirates Cove Cluster System Sewage Disposal Demonstration Site.
- **Franklin County Conservation District**, for addressing agricultural nonpoint source pollution and water quality in Franklin County.
- **University of Kentucky**, for evaluation of existing groundwater quality data in the Kentucky, Salt, Licking, Tygarts, Big Sandy and Little Sandy river basins.
- **American Cave Conservation Association**, for the American Cave and Karst Center Educational Program.

To learn more about the grants or if you are interested in applying for a grant, contact the Nonpoint Source Section, Division of Water, 14 Reilly Road, Frankfort, KY 40601 or e-mail **NREPC.DEPDOWNPS@mail.state.ky.us** to receive a copy of the "Guidance Document for Developing a Competitive Nonpoint Source Project for 2002." Everyone can participate in improving the quality of the waters of the Commonwealth.

Results of inventory are cause for concern

Continued from Page 6

The commission's resources do not allow us to keep pace with the land development pressures on the remnant natural areas. Timely negotiations with landowners are often not possible. Also, recent hikes in timber prices have prevented us from acquiring some of the most ecologically valuable lands.

In the future, we will have to rely more and more on restoration as a tool for natural area protection. This is a difficult task that is unlikely to fully replace the community that has been lost. Exotic plant species that have invaded an area can sometimes be controlled, but often not without an impact on native species. It is also possible to restore certain individual native species. Without good examples of intact natural communities, it will be even harder to restore the degraded ones. It is significantly easier to protect existing high-quality natural areas than it will ever be to restore or recreate them.

For more information regarding Kentucky's natural communities, contact the Kentucky State Nature Preserves Commission at (502) 573-2886 or visit **www.kynaturepreserves.org.**

National Kidney Foundation® Of Kentucky

Making Lives Better

Free recycling program benefits businesses and charity

By Heather Frederick
Public Information and Education Branch

Turn your trash into cash the next time you change the ink or toner cartridge in a printer, copier or fax machine at work. Saving those cartridges can save your company money and generate revenue for the National Kidney Foundation of Kentucky (NKFK). Plus, you help the environment by recycling cartridges that would otherwise end up in a landfill.

The RE-INK4U program helps fund the nonprofit group's programs for kidney patients and their families, as well as research and education. It also makes your company eligible for discounts on the purchase of remanufactured ink cartridges.

Here's how it works: the NKFK places a cardboard box with a plastic liner in your place of business. When the box is full of cartridges, fill out the preprinted form and call a toll-free number to arrange for the free pickup or shipping of the cartridges. The NKFK receives $1 for every inkjet printer cartridge and $2 for each toner cartridge. The foundation also receives those amounts for each refill cartridge your company purchases through RE-INK4U.

The NKFK started the program in November and already has 36 collection sites. To sponsor the program within your company or to get more information, contact Julie or Victoria at the NKFK at (800) 737-5433.

Educational efforts make forestry employee an award winner

By Gwen Holt
Division of Forestry

Spreading the word about the importance of preventing wildfires has led to a prestigious award for an employee of the Kentucky Division of Forestry. Trish Boles received the Robert E. Browning, Jr. Award for her outstanding fire prevention education efforts in 2000. Only one such award is given in Kentucky annually. The Robert E. Browning, Jr. Award was established in memory of a firefighter who was killed in the line of duty in 1994 in Colorado.

Boles is a Knox County forest ranger technician who has been with the division for six years. As a forest ranger technician, Boles fights forest fires, inspects timber harvest operations, conducts forest fire prevention education programs and is a member of the division's fire prevention team. Boles says fire prevention education is her favorite part of her job. She makes Knox and Bell county residents aware of the dangers of forest fires by speaking to civic clubs, appearing with or as Smokey Bear and presenting classroom programs. She has written numerous newspaper articles and worked with local radio stations to broadcast public service announcements.

"Working with kids is the most enjoyable part of my job and it is an honor to receive an award for doing something you love."

Boles rarely misses an opportunity to educate children and young adults about the importance of forest fire prevention. "Working with kids is the most enjoyable part of my job and it is an honor to receive an award for doing something you love," says Trish.

Trish Boles
Photo by Division of Forestry

As a member of the wildland fire prevention team, Trish is stationed in an area with a high number of forest fires. She works one-on-one with residents, local officials and the media to help prevent and reduce the number of fires.

The Division of Forestry is proud to have such a dedicated employee and appreciates her enthusiasm for her job.

We need your help!

Land, Air & Water is mailed to 13,000 subscribers. However, the magazine's subscriber database is very old, and your help is needed in "cleaning up" our mailing list and getting rid of outdated listings. Mailing this magazine unnecessarily wastes paper, trees and other natural resources.

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If you would like to continue receiving *Land, Air & Water* on a quarterly basis, please check the box below and correct your mailing address, if needed, in the space provided. Then, tear off this entire page, stuff it in an envelope and drop it in the mail. The publication will continue to be sent to you **free of charge**.

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